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None

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(54) Abstract Title
Fixing

(57) A fixing for releasably securing a first member (2) to a second member (7) comprises a locator (3) extending from the first member (2), and a lock (8) having a body (10) and a fastener (11) having an opening for receipt of the locator (3). The lock (8) is moveable with respect to the second member (7) between a first position in which the locator (3) is not within the opening and a second position in which the locator (3) is engaged in the opening such that the action of securing the lock (8) retains the locator (3) in place within the opening and secures the lock (8) in relation to the second member (7).

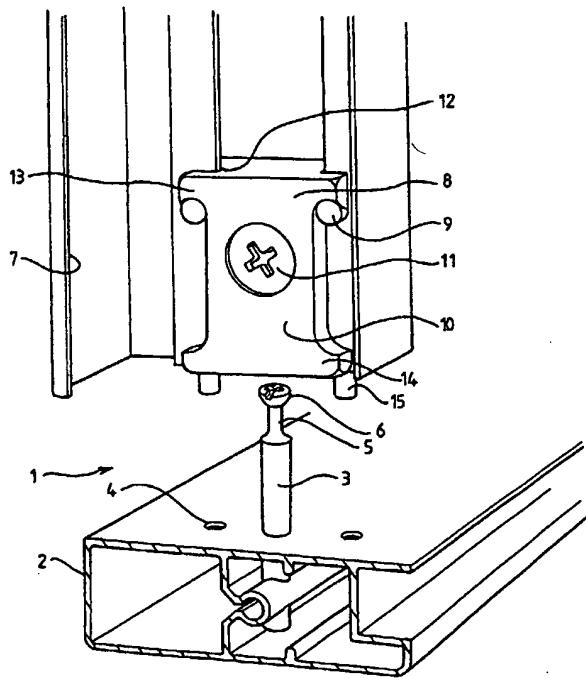


FIG 1

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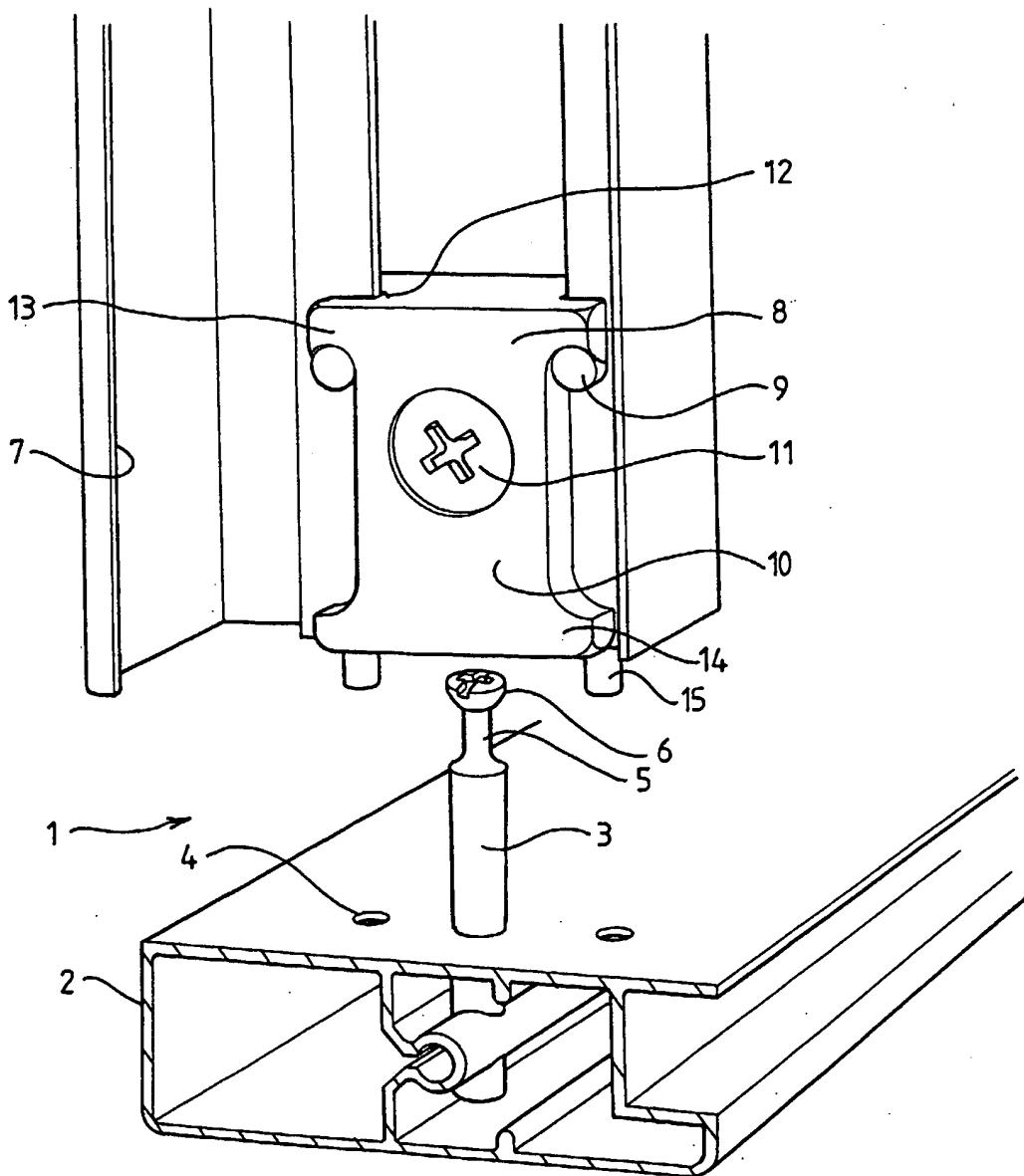


FIG 1

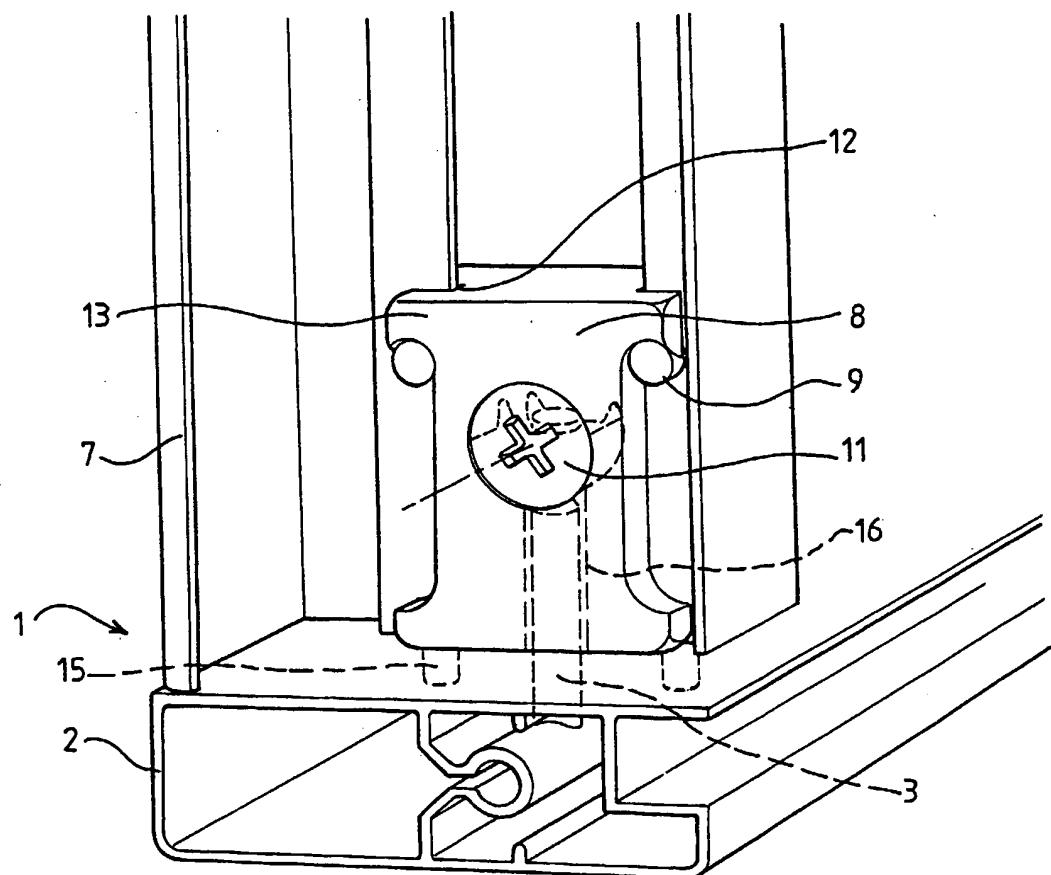


FIG 2

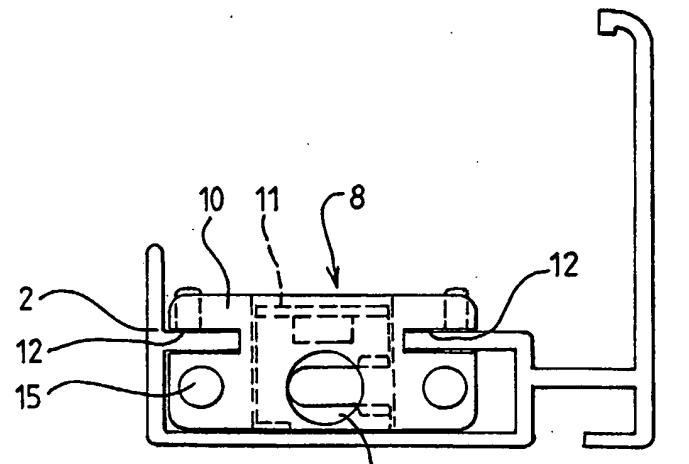


FIG 3

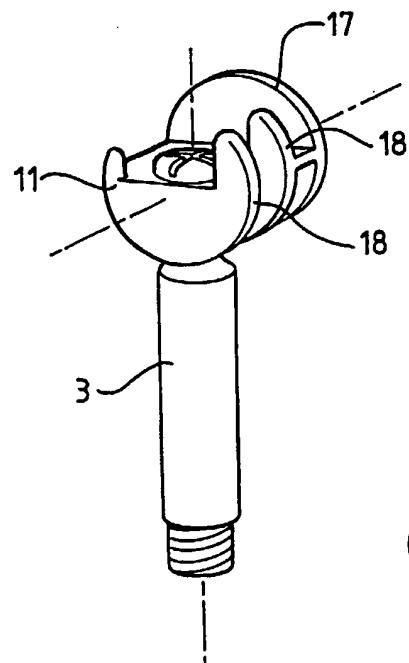


FIG 4
(PRIOR ART)

Title: Fixings

Description of Invention

This invention relates to fixings that may releasably connect and secure one member to another member. It has particular application when the members are structural joints for self assembly furniture, but has far wider functionality. It is of use whenever it is advantageous to adjust the members of a structure before they are finally secured.

It is difficult to maintain the structural members of self assembly furniture in correct alignment whilst adjusting and securing them. Moreover securing the members before the structure is complete tends to result in misalignment.

The present invention addresses this problem, and is relevant whenever the positions of members in a structure may need adjustment before finally being secured.

This invention provides a fixing for releasably securing a first member to a second member that comprises: a locator extending from the first member; a lock having a body and a fastener, and an opening for receipt of the locator and being moveable with respect to the second member between a first position in which the locator is not within the opening, and a second position in which the locator is engaged in the opening; in which the action of securing the lock retains the locator in place within the fastener and secures the lock in relation to the second member.

Thus this invention enables one member to be positioned relative to another member and retained reasonably securely in the desired position before being locked firmly into place. The first member is essentially attached to a moveable part of the second member, that, when locked secures itself to both

the first and the second member, preventing further relative movement. Using this device a structure may be built and adjusted without such necessity to support the various members and without having to fix them finally in position.

Preferably the lock is slideably mounted with respect to the second member. This enables the relative positions of the members to be smoothly adjusted.

The lock may further comprise locating protrusions that locate in respective apertures in the first member. These further secure the two members, and prevent relative rotation of the members. Preferably when the lock is slideably mounted with respect to the second member, the length of the locating protrusions determines the degree of relative sliding that may occur. Advantageously the protrusions are an interference fit in the apertures. This increases the security of the fixing.

The fixing may further comprise formations on the second member that abut the lock when secured. This limits the freedom of movement of the lock with respect to the member and provides a defined point for securing the lock.

A lock with such fixings may further comprise corresponding formations that constrain movement of the lock with respect to the second member, and which abut the formations on the second member when the lock is locked against them. These assist in defining one end of the lock's range of movement. The formations are preferably hook shaped, one extending from each lateral side of the lock, to hook over the formations on the second member, which are preferably pins.

The locator may be a pin of elongate cylindrical form, which may be received into a respective hole in the lock. This provides a simple and secure temporary fixing. Preferably the pin has a head and a neck and is so constructed that the head may pass into a fastener in the lock when the lock is unlocked, and the locking mechanism involves the fastener clamping on the neck of the pin so that the pin cannot be removed from the secured lock.

Preferably the first and second members are structural components of an item of furniture. The ability to adjust the structural components of an item of furniture, after they have been assembled enables the furniture to be precisely fitted. The structure may also be self supporting as it is assembled, taking a good deal of strain out of the assembly.

Preferably the first and second members are made of aluminium. This enables the finished structure to be light. Aluminium is easily coated or vinyl wrapped to achieve the look of wood, or may be anodised for a funky modern feel.

Advantageously the lock is made of a plastics material. It may thus be formed into a complex shape as required by the shape of the members, and the relative movement between them that must be achieved. The fastener may be made of metal. This provides a secure and strong fixing.

This invention also provides a method of assembling a first member and a second member, comprising: moving the first member with respect to the second member, until approximately the desired relative positions are achieved; releasably fixing the first member to a lock associated with and moveable with respect to the second member; making final adjustments to their relative positions; and securing the lock to prevent further relative movement between the first member and the second member.

There will now be given a detailed description, to be read with reference to the accompanying drawings, of a furniture fixing which is a preferred embodiment of this invention, having been selected for the purposes of illustrating the invention by way of example.

In the accompanying drawings:

Figure 1 shows schematically an exploded perspective view of a fixing according to the invention;

Figure 2 shows schematically a front view of the fixing of Figure 1 with the lock secured;

Figure 3 shows schematically a front view of the underside of the lock of Figure 1; and

Figure 4 shows further details of the cam fastening mechanism, in its locked position.

In Figure 1 a fixing 1 is shown with the components aligned in a suitable position from which they may be placed together and secured. In a typical application it forms part of a self assembly furniture kit.

A first member 2 comprises a hollow generally rectangular section of extruded aluminium with a pin 3 driven into the section. The pin 3 is substantially orthogonal to the long surface of the member 2. Two holes 4 are positioned either side of the pin 3, the three forming a substantially straight line.

The pin 3 is of generally elongate cylindrical form, with a narrow neck section 5 below a wider top section 6.

A second member 7 is also a hollow elongate structure formed from extruded aluminium. The main section of the member resembles a "c". Slideably mounted on the prongs of the "c" section, adjacent one end of the second member, is a lock 8. Two pegs 9 protrude from either prong of the "c" section.

The lock 8 is of generally parallelepiped form. It comprises a body 10, made from a fibre filled plastics material and a cam fastener 11, made from a metal, and contained within the body 10. The pin 3 and the cam fastener 11 are a known type of fixing such as those sold under the name Camlock®. Grooves 12 on opposite sides of the body 10 allow the lock 8 to slide along the prongs of the "c" section of the second member. Two hooks 13 are formed in two corners of one end of the body 10, and two steps 14 are formed in the two opposite corners. The pegs 9 are driven into the second member 7 close to one of its ends. The lock 8 is positioned in the second member 7 so that the stepped end is closest to that end of the second member 7. Indeed when the lock 8 is

slid so that the hooks 13 abut the pegs 9 the underside of the lock 8 is level with the end of the second member 7. The steps 14 and the hooks 13 abut the pegs 9 when the lock 8 is slid to either end of its range of motion.

Two posts 15 protrude from the end of the body 10 of the lock 8 with the steps 14. This is the underside of the lock 8, as illustrated in Figure 1. The posts 15 are generally cylindrical in form. They are positioned either side of an opening 16 (shown in Figure 3) in the underside of the lock 8.

Figure 2 shows the first and second members secured and locked to each other. The pin 3 locates in the opening 16 on the underside of the lock 8 as the second member 7 is brought towards the first member 2. As the two members are brought more closely together, if the cam fastener 11 is in its open position, the head of the pin 3 passes into the cam fastener 11.

The posts 15 on the underside of the lock 8 then locate in respective holes 4 on the first member 2. The posts 15 form an interference fit in the holes 4, enabling the first member 2 and second member 7 to be held reasonably securely relative to each other when the posts 15 engage. The posts 15 also prevent rotation of the two members, and play a part in securing the lock 8.

When the lock 8 is positioned with the tops of the posts 15 just engaged with the holes 4, the second member 7 can be moved with respect to the first member 2. It may be moved until the pegs 9 abut the hooks 13 of the lock 8. The two members remain secured relative to each other throughout this movement.

When the members have been adjusted to their desired positions the cam fastener 11 may be activated by turning it through ninety degrees. This enables the cam fastener 11, situated inside the body 10 of the lock 8, to secure the neck of the pin 3, as shown in Figure 2 and Figure 4.

Figure 3 shows a front view of the underside of the lock 8, engaged in the second member 2. The cam fastener 11 is drawn as a broken line in the

Figure. The opening 16 is near the midpoint of the base of the lock 8, and leads to the cam fastener 11.

The cam fastener 11 is shown engaged in its locked position with the pin 3 in Figure 4. It comprises a face 17, and two discs 18. The discs 18 are spaced apart at a distance less than the diameter of the head 6 of the pin 3 but more than the diameter of the neck 5 of the pin 3. They are arctuate in form, their arcs sweeping out about two thirds of a circle. Approximately one third of circle is therefore not occupied by the discs 17. When the fastener 11 is in this position the pin 3 may slide into it until the pin head 6 abuts the centre of the fastener. When the fastener 11 is turned, the discs 17 move into position and prevent removal of the pin 3. The two members may thus be locked together. This position is shown in Figure 4.

Even when the pin head 6 just rests in the cam fastener 11, the frictional fit, combined with the interference fit of the posts 15 in holes in the first member 2 enables the two members to be held reasonably securely whilst their final relative position is adjusted.

In this way a secure, releasable locking facility is provided to link two members, whilst making provision for small adjustments while the members are secured together to optimise their relative positioning.

Although the example above illustrates one use of the invention as a furniture fixing, many other uses are possible, such as partitioning, exhibition stands, door frames, etc..

The body 10 may be made of other materials, such as non-fibre filled plastics, metals etc., and the pin 3 and cam fastener 11 may be made from materials other than metal.

Furthermore, the fixing may be used with members made from other materials and made other than by extrusion; For example it may be used with steel section members, or even with wood.

In the present specification "comprise" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A fixing for releasably securing a first member to a second member comprising:
 - a locator extending from the first member;
 - a lock having a body and a fastener, and an opening for receipt of the locator and being moveable with respect to the second member between a first position in which the locator is not within the opening, and a second position in which the locator is engaged in the opening;
 - in which the action of securing the lock retains the locator in place within the fastener and secures the lock in relation to the second member.
2. A fixing according to Claim 1 in which the lock is slideably mounted with respect to the second member.
3. A fixing according to any preceding claim in which the lock body further comprises locating protrusions which locate in respective openings in the first member when the lock is in its second position.
4. A fixing according to Claim 3 in which the protrusions are an interference fit in the openings.
5. A fixing according to any preceding claim further comprising formations on the second member that the lock abuts in its second position and is locked against.
6. A fixing according to Claim 5 further comprising corresponding formations on the lock body which constrain movement of the lock with respect to the second member.

7. A fixing according to any preceding claim in which the locator is a pin of generally elongate cylindrical form, which may be received into the opening in the lock body.
8. A fixing according to Claim 7 in which the pin has a head and a neck and is so constructed that the head may pass into the fastener when the lock is unlocked, and securing the lock involves the fastener fastening on the neck of the pin so that the head of the pin may not pass back when the lock is locked.
9. A fixing according to any preceding claim in which the first and second members are structural components of an item of furniture.
10. A fixing according to any preceding claim in which the first and second members are made of aluminium.
11. A fixing according to any preceding claim in which the lock body is made of a plastics material.
12. A fixing according to any preceding claim in which the fastener is made of metal.
13. A fixing device substantially as hereinbefore described and/or as shown in the accompanying drawings.
14. A lock for use in a fixing device according to any previous claim.
15. A method of assembling a first member and a second member, comprising:

moving the first member with respect to the second member, until approximately the desired relative positions are achieved;

releasably fixing the first member to a lock associated with and moveable with respect to the second member;

making final adjustments to their relative positions; and

securing the lock to prevent further relative movement between the first member and the second member.

16. Any novel feature or combination of features described herein and/or in the accompanying drawings.



Application No: GB 0030329.7
Claims searched: 1 - 15

Examiner: Peter Macey
Date of search: 22 February 2001

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): F2M (MB2)

Int Cl (Ed.7): F16B 12/20, 12/32

Other: Online: WPI, EPODOC, JAPIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
	NONE	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.